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P01/7700 0.00-0214714.8

Request for grant of a patent

1/77

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1.	Your reference	PAT 02301 GB
2.	Patent application number	26 JUN 2002 0214714.8
3.	Full name, address and post code of the or of each applicant Patents ADP Number 07652217001 If the applicant is a corporate body, give the country/state of its incorporation	Nokia Corporation Keilalahdentie 4 02150 Espoo Finland Finland
4.	Title of the invention	Interaction with a Mobile Device
5.	Name of your agent "Address for service" in the United Kingdom to which all correspondence should be sent Patents ADP number	Nokia IPR Department Nokia House, Summit Avenue Farnborough, Hants GU14 ONG 7577638001

6.	If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and the or each application number	Country	Priority Application Number	Date of Filing
7.	If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application	Number of earlier application		Date of Filing

8. Is a statement of inventorship and of right to grant of a patent required in support of this request? (Answer 'Yes' if:

a) any applicant named in part 3 is not an inventor, or
b) there is an inventor who is not named as an applicant, or
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Yes

Patents Form 1/77

9. Enter the number of sheets for any of the following items you are filing with this form. Do not count copies of the same document

Continuation sheets of this form

Description 7

Claims(s) 1

Abstract

Drawing(s) 5 of

10. If you are also filing any of the following state how many against each item.

Priority documents

Translation of priority documents

Statement of inventorship and right to grant of a patent (Patents Form 7/77)

Request for preliminary examination and search (Patents Form 9/77)

Request for substantive examination (Patents Form 10/77)

Any other documents (please specify)

11. I/We request the grant of a patent on the basis of this application.

Signature Helen Haws Date 26/6/02

Helen Haws

12. Name and daytime telephone number of person to contact in the United Kingdom

Helen Haws - 01252 865262

PAT 02301 GB

Interaction with a Mobile Device

A few observations underpin the invention disclosed herein.

People normally carry a lot of items, especially in their wallets.
People take comfort in fiddling with things, especially under the pressures of modern society.
People like to control what they project about themselves to society, and often like to share the image of their peer group.
Users demand more features on their mobile phones, but this tends to make the mobile phones harder to use.

The present invention is concerned with tackling the concerns engendered by the above observations.

By way of technical background to the invention, RF tag (or an "RFID") technology has become technically mature and is being adopted in different fields ranging from, for example, storage management to electronics tickets in commuting. At present, RF tags are available at about the size of a sand grain and at low cost.

RF tags can be categorized in the following ways:

Active or passive. Passive RF tags require external stimulus to read / write information. Active RF tags include their own power supply.

Electromagnetic or RF.

Writeable or read only. Writeable RF tags can store information received over the air. Read-only RF tags have a pre-programmed ID which cannot be altered.

With this in mind, according to an aspect of the invention, there may be provided an iBead comprising an RF tag embedded in a shell/casing sized and shaped to be handled by the user - beyond this dimensional limitation, there is no limit on the look of the shell except to say that, in preferred embodiments, the iBead may be a gewgaw, ideally appealing to the fashion or aesthetic sensibilities of the user and serving as a fashion accessory, or emblem for a particular group. The shell may also be protective to shield the RF tag from damage. A means of reading the iBead, called an iBead Reader, may be incorporated into an electronic, portable device, normally having a different primary purpose for example, a radiotelephone, and may include a mechanism for guiding the shell into the correct position to be read. The RF tag combined with an IMEI code or some other means of identifying the user or device, may be associated with a macro which is held on the electronic, portable device , on a remote server, or on another device. When the user initiates the reading of the iBead RFID tag the device which hosts the iBead reader requests a corresponding macro, by checking locally on the device (or other local memory), checking on a remote server, and checking on a remote device. Any possible order is possible for these checks. The instructions, which may be encrypted, for carrying out the macro are returned to the device and carried out. Instructions that are not initially held locally may be cached locally once they have been retrieved. The macro to be carried out can change according to a number of factors including: the type and frequency of interaction; the user; the type of iBead. The type and frequency of interaction of the iBead can be monitored in real time the retailer offering services represented by the macro. The retailer is able to change the macro in real time. The user may be able to monitor in real time which iBeads are currently active and may be able to customise the macros which the iBeads have access to.

According to another aspect of the invention, there may be provided a system comprising an iBead and an electronic device having an iBead reader, in which system, in response to the iBead reader reading the iBead, the electronic device performs an operation associated with said iBead. Said operation can be a macro as described above.

By using a given iBead to initiate a macro the user mentally associates a physical object with a certain operation which serves to create the impression for the user that electronic device is easier to use.

A typical user may carry a number of iBeads. In order to differentiate between iBeads which may all may be in the range of the IBead reader, according to another aspect of the invention, there may be provided an iBead having means by which the it can be switched between an inactive mode to an active mode in which it can be read. Preferably, the active mode is entered when the iBead is docked with an electronic device having an iBead reader. For example, the electronic device may be a handset of a radiotelephone.

From a technical standpoint the RFID technology does not require contact between an iBead and iBead reader in order to function. But from the user experience standpoint, some kind of tactile interaction is sometimes preferable. Accordingly, according to another aspect of the invention, there may be provided a system comprising an iBead, an electronic device having an iBead reader and docking means for docking an iBead, the system being operable in response to the iBead docking with an iBead to trigger the reading thereof. The docking may be *pressing, skimming, coupling, docking or docking and locking.*

The *docking and locking* embodiment provides a platform for another aspect of the invention. According to this aspect of the invention, there be may provided an iBead comprising an RFID tag embedded in a shell/casing sized and shaped to be handled by the user, and means to make the iBead user feedback. Further, there may be provided a system comprising an iBead including user feedback means and an electronic device having an iBead reader to which said iBead can be lockingly engaged, and means for activating the user-feedback means to indicate predetermined conditions. Preferably, the user-feedback means is an LED by which the iBead can glow. Alternatively, the user-feedback means can additionally or alternatively provide an audible signal or can rotate the housing of the iBead.

Exemplary embodiments of the invention are herein described with reference to the accompanying drawings, in which:

Figure 1 shows a first embodiment of the invention;

Figure 2 shows a second embodiment of the invention: in the upper half of the figure in an inactive, undocked state, in the lower half of the figure, in an active, docked state;

Figures 3-8 show various ways an iBead can interact with an iBead reader, each providing the user with a different interaction experience; and

Figure 9 shows a glowing iBead in accordance with the invention.

A mobile communication device 1a includes an iBead Reader 2 which enables the RFID tag in the iBead 3 to be read. First, the device 1a checks to see if there is a corresponding macro for that RFID tag held locally on the device 4. If a macro is stored locally, it is carried out on the device. If there is no locally held macro, then the device sends a request 5a to a designated server 6 to see if there is a corresponding macro located there. The request 5a can be combined with the IMEI or some other means of identifying the user. If a macro is found the instructions are returned to the device 5a and carried out. If no macro is found on the server 6, the device may send a request to a device using peer to peer protocols 7. Again, if a macro is found, it is sent to the device and carried out.

The iBead can be pre-programmed by a retailer 8 to complete a macro. The retailer can check the use of the iBead in real time 9 and can adjust the macro accordingly. If, for example, the iBead is docked on a second person/device 1b the request for information and the macro 5b can be the same, different or accumulative to the first request 5a. This enables, for example the user of device 1a to receive credits 10 to an online iBead servicing account 11. Lastly, the user can check the status of his/her iBead use 12 in real time through their account.

It will be thus appreciated that when a physical object represents a macro (task) it is easier for the user to remember to do that task. E.g. a bead with the CNN logo which fetches the current news CNN headlines is a constant reminder to access that information. This is good from the operator or service-provider standpoint as this

could lead to increased average revenue per customer. Also, because an iBead can be swapped amongst users easily, this can lead to the leveraging of natural network effects to distribute content, and reward the distribution of content. For example, the original registered owner of an iBead could be paid a royalty on the basis of the amount of revenue generated by other users using the iBead. The iBead can also serve as a real time interface for retailers and users.

Users preferably carry a number of iBeads in order to activate several tasks/macros. When there are multiple iBeads in the vicinity of a reader, selecting the desired one becomes complicated. One possible solution is by means of a menu. In a preferred embodiment showed in Figure 2 (top half) the iBead is not docked and not activated, and thus cannot be read. In the bottom half of Figure 2, the iBead is docked, and can be read. Thus, the docking serves as a way to activate the iBead for reading and thus provides a mechanism for selecting which of the user's iBeads to read.

There are various ways to activate the iBeads. Mechanical activation. For example, a magnet in the reader (handset) cause mechanical movement inside the iBead and activates the resonator, whereby the docking mechanism short-circuits part of a circuit, thereby activating the resonator. Resonator circuit activation, in which the iBead is provided with a magnetic resonator which when remote from the reader does not resonate; but when it is brought close to the reader, the a matched circuit in the reader causes the resonator inside the iBead to resonate.

When this approach is employed using passive, read-only RF tags, which have no security provided, whereby the fixed 128 bits of information can be read by any third party, this approach provides an element of security in that it makes the reading possible only during docking.

Referring to Figure 3, an iBead comprising an RFID tag 1a embedded into a protective and/or decorative shell 2 is shown. An RFID reader 4 is located close to a docking mechanism 5, and both are embedded into a phone cover 6. The interaction between iBead and reader may be loosely described as skimming. The arrow 7 shows the motion of the shell required to initiate a non-contact data transfer 8a. For skimming, the RFID shell 2 only needs to pass in the proximity of the RFID

reader 4 in order to the RFID tag to be read 8a. This is typical of how RF tags are read in typical unrelated applications.

From a technical standpoint the RF tag technology does not require contact between an iBead and iBead reader in order to function. But from the user experience standpoint, some kind of tactile interaction is sometimes preferable.

A spring/switch is built into the in the RFID reader and/or docking mechanism 5 providing improved tactile feedback when interaction occurs.

Referring to Figure 4, the RFID shell containing a low power RFID tag 1b also includes a docking mechanism 9. It is inserted into the RFID reader. Downward pressure on the shell 10 by the user reduces the proximity to a level where the RFID tag can be read 8b. Without downward pressure, the RFID tag will normally fall out of the RFID reader, and the RFID tag cannot then be read. The RFID shell includes a docking mechanism such as a groove 11 (see Figure 6) where the shell remains in the RFID reader during normal use of the phone. The RFID tag is read 8c by the RFID reader when the user presses down 12 on the RFID shell. The RFID tag behaves much like a button, except that it can be easily removed from the docking mechanism.

Referring to Figures 7 and Figure 8, the RFID shell is pressed into the docking mechanism and is twisted 13 to lock it into place. The RFID tag is read using a pressing interaction previously described in Figure 4.

The RFID shell behaves much like a button.

To unlock and remove the RFID shell, it is twisted in the opposite direction and pulled.

Example: A users buys a bead and programs it to open a page of the news headlines. He doesn't like carry beads on a strap, and since this is the one thing he does every day he locks the bead 'permanently' into the RFID reader.

Thus it will be appreciated that having a physical object (e.g. a bead) representing a task or thing (e.g. call Suzy or get latest news) can be easier for the user to understand, since there is a 1 : 1 relationship between the task, and the tool used to complete the task. Also, tactile feedback is a natural extension of what humans already do, for example when we shake hands, or exchange business cards.

The Figure 8 embodiment of the invention, where the iBead almost adopts the role of a button, is the basis for a further aspect of the invention which is shown in Figure 9. The iBead Reader has access to a power source (13). Whist it is docked a direct contact is made between the iBead (15) and the iBead Reader (14). Acting on instructions from the phone, another device or a remote server, an electrical current is sent to the iBead. This can be used to power electronics in the RFID shell such as a diode, a small speaker, a bi-polar display or a mechanical device (16).

This embodiment improves user feedback on a mobile electronic device. It is particularly suited for status related tasks where the user needs to be kept informed with the status of a task.

Example 1: The user buys an "WLAN status bead" to check when they are in range of a WLAN hotspot, and docks it on their functional cover. The bead glows when it is in range (after getting the information from the handset).

Example 2: The user buys a "Wizard Bead" for their online gaming environment, which represents the health of their character in the online world. When the character is in danger, the wizard-shaped bead glows red, prompting the user to interact more with the online world.

Example 3: The user decides to back up the photos in their phone's inbox to their Club Nokia storage space. The status iBead flickers showing the data being sent, and glows green once the transfer is complete.

Thus, it will be appreciated that the described embodiments of the invention provide a solution which might replace some of the utilitarian things which people carry in their wallets with potentially items which can serve as fashion items but also have a function, this function being to simplify the, for example, mobile phones are used.

CLAIMS

1. An iBead comprising an RF tag embedded in a casing sized and shaped to be handled by the user.

2. An iBead as in Claim 1, including means for making the iBead provide user feedback under predetermined conditions.

3. An RF tag embedded in a gewgaw.

4. A system comprising an iBead and an electronic device having an iBead reader, in which system, in response to the iBead reader reading the iBead, the electronic device performs an operation associated with said iBead.

5. An iBead as in Claim 1, further comprising means by which it can be switched between an inactive mode to an active mode in which it can be read.

6. A system comprising an iBead, an electronic device having an iBead reader and docking means for docking an iBead, the system being operable in response to the iBead docking with an iBead to trigger the reading thereof.

7. A system comprising an iBead including glow means and an electronic device having an iBead reader to which said iBead can be lockingly engaged, and means for providing user-feedback to indicate predetermined conditions.

Figure 1

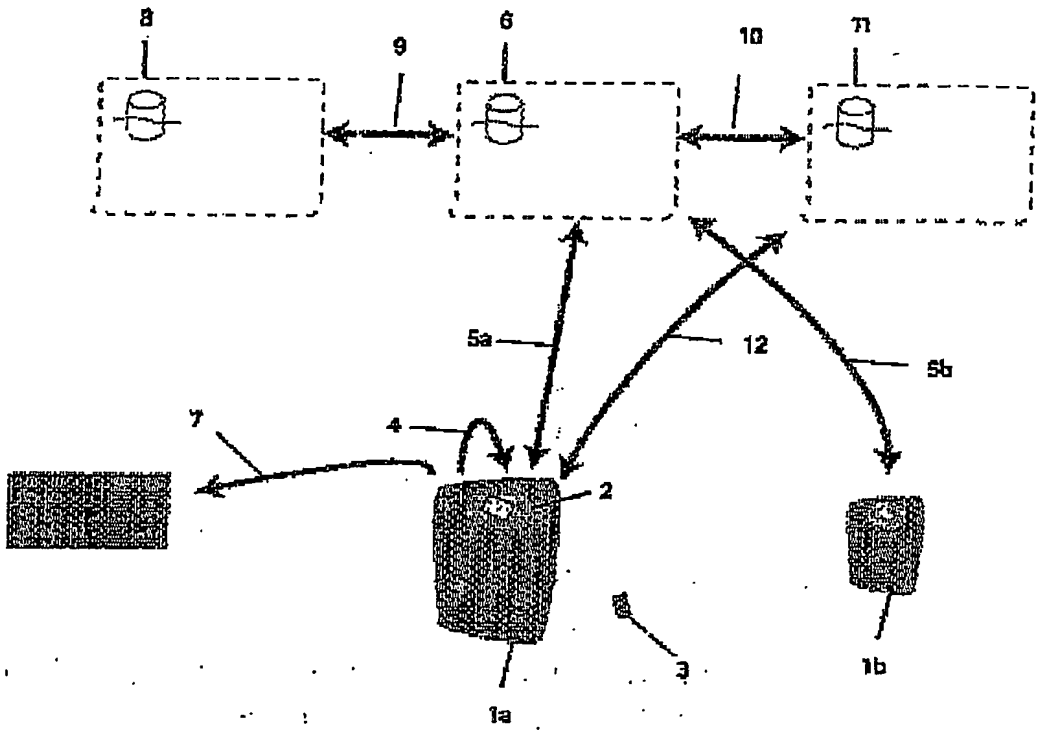

Figure 2

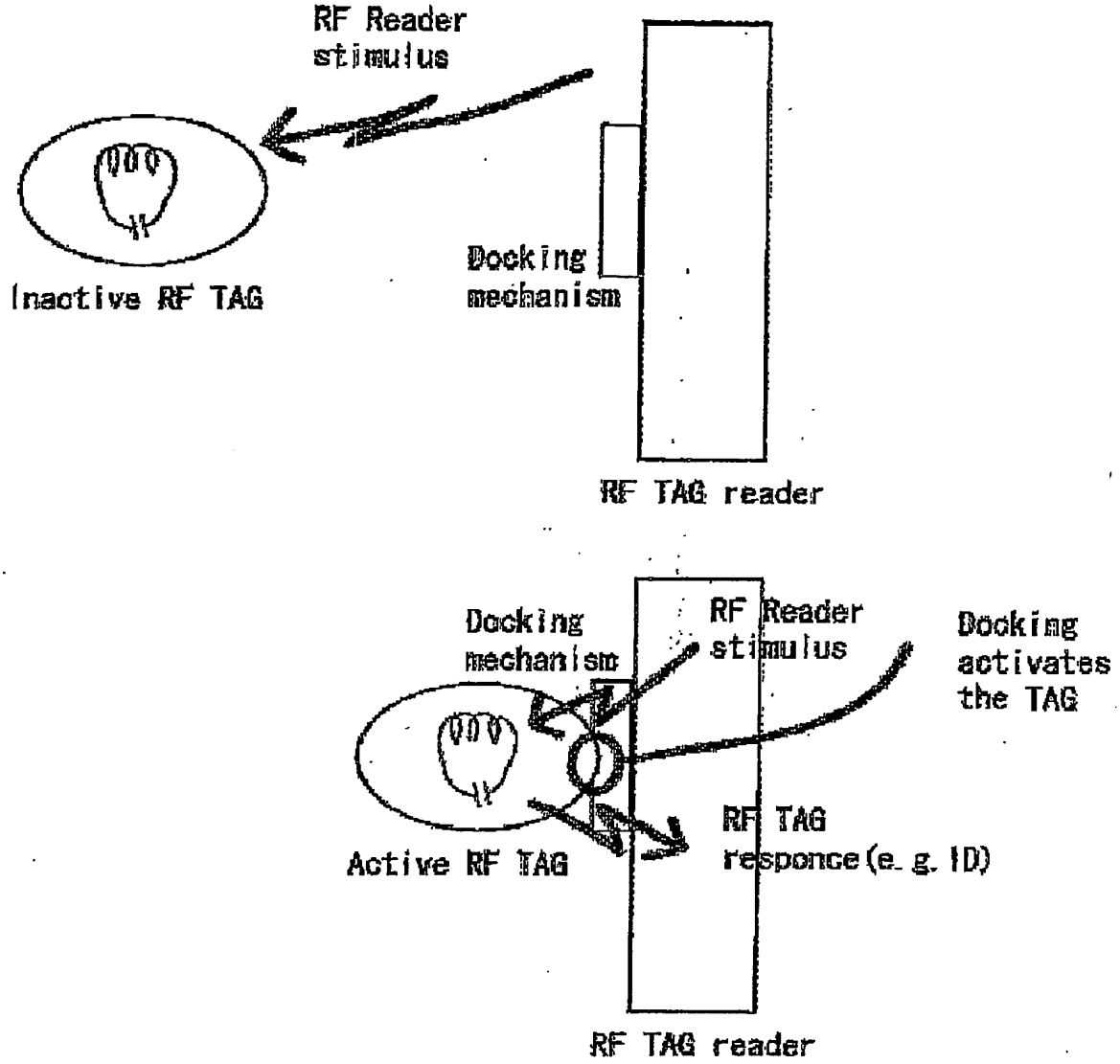
RF Reader
stimulus
Inactive RF TAG
Docking
mechanism
RF TAG reader
Docking
mechanism
RF Reader
stimulus
Docking
activates
the TAG
Active RF TAG
RF TAG
responce (e.g. ID)
RF TAG reader

Figure 3

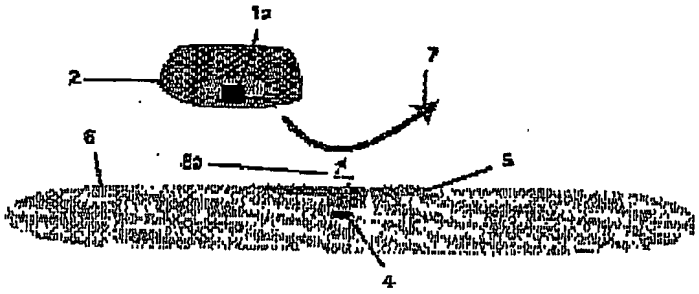

Figure 4

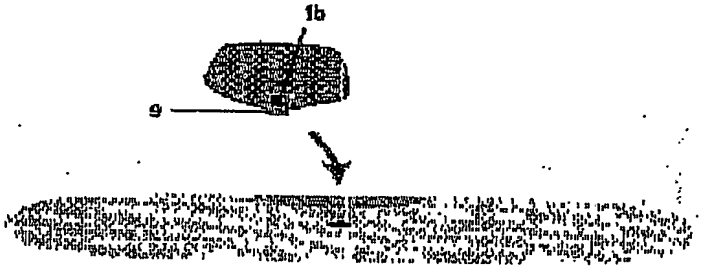

Figure 5

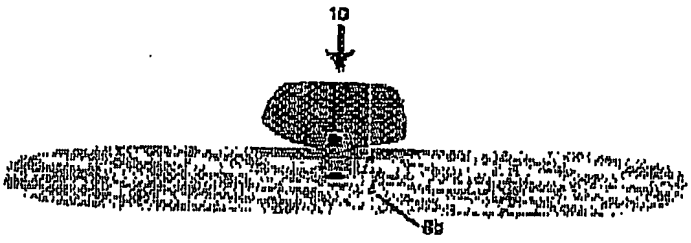

Figure 6

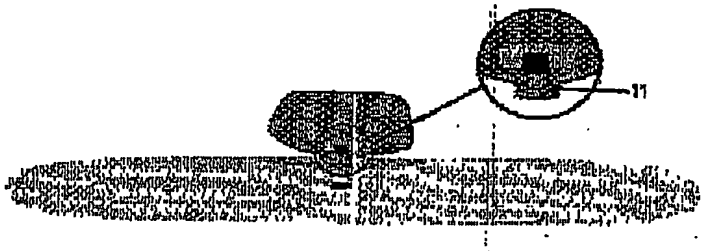

Figure 7

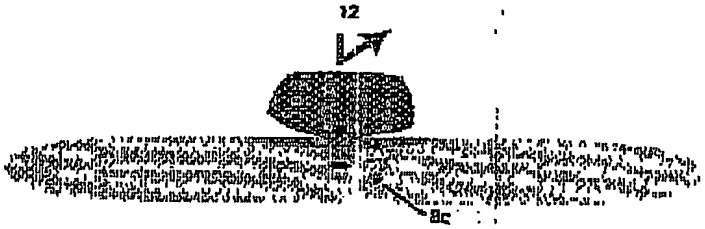

Figure 8

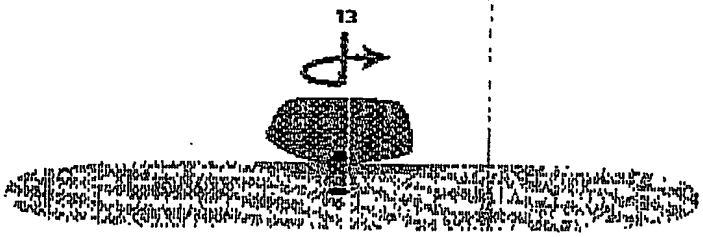

Figure 9